

ON A COLLECTION OF FISHES MADE IN KOREA, BY
PIERRE LOUIS JOUY, WITH DESCRIPTIONS OF NEW
SPECIES.

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of the Stanford University.

In 1885, the late Mr. Pierre Louis Jouy, then an assistant to the United States National Museum, visited Korea from Japan, making a considerable collection of fishes for the United States National Museum. We give in this paper a list of the species contained in that collection and those obtained by Ensign J. B. Bernadou, U. S. N., in the vicinity of Chemulpo, where he collected from September, 1884, till April, 1885, with descriptions of those new to science. It is evident that the marine fauna of Korea is essentially that of Japan, while that of the rivers is different as to species, and is as yet practically unknown. The plates accompanying this paper are drawn by Mrs. Chloe Lesley Starks. For the opportunity of studying the collection we are indebted to the courtesy of Mr. Richard Rathbun, Assistant Secretary of the Smithsonian Institution.

Family EPTATRETIDÆ.

1. EPTATRETUS BURGERI (Girard).

Fusan.

Family CLUPEIDÆ.

2. HARENGULA ZUNASI (Bleeker).

Gensan.

Apparently the name *Sardinella* was first used for a species, properly referable to the genus later called *Sardinia* by Poey. The name *Clupanodon* should, in our present view, be restricted to the first species named under it, in which case it is equivalent to *Comosirus* of Jordan and Snyder.

Family ENGRAULIDIDÆ.

3. ENGRAULIS JAPONICUS Schlegel.

Gensan.

4. TRICHOSOMA HAMILTONII (Gray).

Anal 38. Gill-rakers nearly as long as eye; 16 on lower limb of arch. Maxillary reaches to base of lower pectoral ray. Ventral scales 15+10.

A single specimen in the collection labeled "Korea."

5. SETIPINNA GILBERTI Jordan and Starks, new species.

Dorsal 1, 11; anal 57; scales 44 (?). Head,^a 5 in length; depth, $3\frac{1}{2}$. Eye, $4\frac{1}{2}$ in head; snout, $5\frac{1}{2}$; maxillary, $1\frac{1}{10}$; interorbital width, $3\frac{1}{2}$.

Snout short, projecting but slightly beyond mouth. Maxillary reaching to within a little less than the diameter of the pupil of the

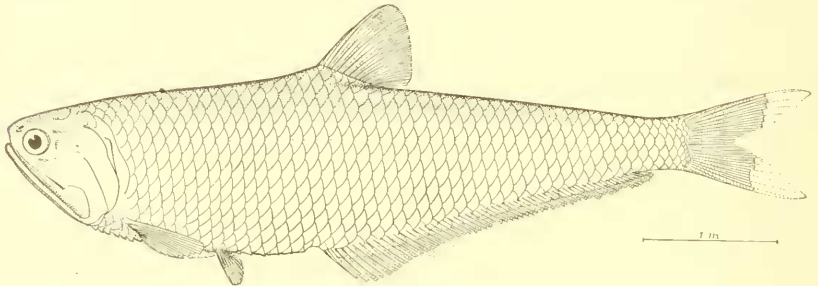


FIG. 1.—SETIPINNA GILBERTI.

edge of the opercle: its end dilated into a thin semicircular lamella behind. Teeth on maxillary a little larger than those on mandible. Gill-rakers slender, their number 13+16.

Scales nearly all missing on our specimens. A series of 4 on the posterior part of the body of the type occupy about the same space as a like number just behind the pectoral. Measuring with these as a standard there would be 44 scales in a longitudinal series. There are 18 ventral scales before the ventrals and 8 behind.

Dorsal with short stout spine, scarcely attached to the dorsal rays. Base of first dorsal ray nearer tip of snout than base of caudal by a distance equal to the postorbital part of head, or to the length of dorsal base. Pectoral filament longer than the head by one diameter of the eye; its tip reaching very slightly past tips of ventrals.

Ventrals inserted midway between front of anal and base of pectorals. Ventrals contained $3\frac{1}{2}$ times in head. Front of anal under the

^aAll of the measurements pertaining to the head in this group are taken obliquely from the tip of the snout to a little above the pectoral fin, the greatest length of the head.

first or second dorsal ray. Anal base shorter than half entire length (without caudal) by half the diameter of eye.

Color uniform silvery on head and sides, shading into light brown on back. Fins all colorless.

The body of this species is more slender than in either *S. melanochir* or *S. taty*; the height being nearly a fourth of the length rather than a third, or less than a third. The origin of the anal is under the anterior dorsal rays and the pectoral filament is short as in the former species, but the origin of the dorsal is nearer the snout than base of caudal and the number of anal rays is greater as in the latter species.

The type is 145 mm. in entire length and labeled "Korea." It is numbered 37766, U. S. National Museum, and was collected by Ensign J. B. Bernadou, U. S. N., at Chemulpo, 1884-1885.

A cotype from Ninsen, Korea, was presented by the Imperial Museum, Tokyo, Japan. It is numbered 8659, Ichthyological collections, Stanford University.

Named for Dr. Charles H. Gilbert.

Family SALMONIDÆ.

6. PLECOGLOSSUS ALTIVELIS Schlegel.

Korea.

Family CYPRINIDÆ.

7. CYPRINUS CARPIO Linnæus.

Common.

8. CARASSIUS AURATUS (Linnæus).

Common.

9. OCHETOBIUS LUCENS Jordan and Starks, new species.

Dorsal 11; anal 11; scales 65; 9 from dorsal and 4 from anal to lateral line. Head 5 in length; depth $6\frac{3}{4}$. Eye $4\frac{1}{4}$ in head; snout 4; maxillary $3\frac{1}{2}$; interorbital space $3\frac{3}{4}$.

Body elongate and compressed; head pointed. Snout rather sharp, scarcely longer than eye, jaws even when mouth is closed; the lower with a slight projection on upper edge at symphysis. Maxillary reaching to below anterior margin of eye. Interorbital space evenly rounded; large supraorbitals forming its outer edges. Gill-rakers numerous, long and slender, those near the angle of the arch half as long as eye; 6+22 in number. Pharyngeal teeth rather slender and slightly hooked, 5, 4, 2-2, 4, 4 in number.

Scales moderate in size, thin and not very firmly attached. Lateral line bending downward and running along lower half of side and through middle of caudal peduncle; no abrupt bends in it anywhere.

Dorsal nearer tip of snout than base of caudal by a distance equal to $1\frac{1}{2}$ times the eye; its posterior outline very slightly concave; length

of anterior rays contained $1\frac{2}{3}$ times in head; when fin is depressed the anterior rays reach beyond the tips of the last. First anal ray is nearer base of caudal than base of first ventral ray by one diameter of eye. Insertion of ventrals directly under first dorsal ray; length of ventrals $1\frac{3}{5}$ in head; that of pectoral $1\frac{1}{2}$. Caudal forked.

Color bright silvery, blue brown on back, shaded rather abruptly to the silver below. Fins all colorless. Peritoneum white.

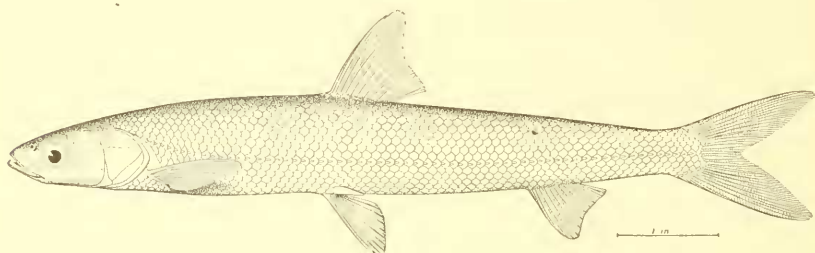


FIG. 2.—*OCHETOBIUS LUCENS*.

This species is close to *O. elongatus* (Kner.). The eye is larger, the maxillary reaches farther back, the snout is shorter as compared with the eye, and the interorbital space is narrower.

The type and sole specimen was collected by Jouy at Chemulpo, Korea; it is 20 cm. in entire length, and is numbered 51496, U. S. National Museum.

4. *LONGURIO* Jordan and Starks, new genus.

Body very elongate and nowhere compressed. Snout rounded and projecting beyond an inferior V-shaped mouth. A barbel present at

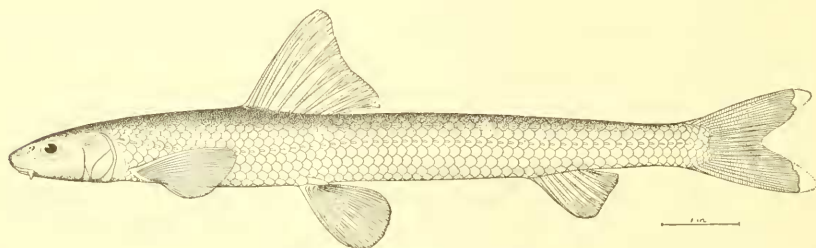


FIG. 3.—*LONGURIO ATHYMIUS*.

the end of maxillary. Pharyngeal teeth 5, in a single row, some of them molar-like. Scales moderately large. Lateral line running through middle of caudal peduncle. Dorsal without osseous ray, placed rather anteriorly, its anterior half or more in advance of ventrals. This genus seems to have some affinity with *Pseudogobio*, but the relationship is not at all close.

10. LONGURIO ATHYMIUS Jordan and Starks, new species.

Head, $6\frac{1}{10}$ in length; depth, $9\frac{1}{2}$. Dorsal, 9; anal, 8; scales, 55. Eye, $5\frac{1}{2}$ in head; snout, $2\frac{1}{6}$; maxillary, $3\frac{1}{4}$; interorbital space (bone only), $3\frac{1}{6}$.

Body elongate; not compressed; the back not at all elevated; tapering very slightly and gradually to the caudal peduncle. Snout blunt and rounded, projecting beyond the mouth a distance equal to three-fourths the diameter of the eye. Mouth broadly V-shaped, entirely inferior, the tips not thickened. Maxillary reaching to below posterior nostril, its end with a barbel nearly equal in length to the eye. Eye elliptical; its length contained $1\frac{3}{4}$ in snout. Gill-rakers short and weak, 3×14 in number. Pharyngeal teeth 5 in single row; the anterior 2 blunt and rounded, the others with a concave surface.

Scales large, rather firmly attached and regularly arranged; an enlarged scale at base of ventral. Lateral line slightly bending down anteriorly and running straight backward through middle of caudal peduncle.

First ray of dorsal placed at the beginning of the anterior third of the distance between base of caudal and tip of snout. Posterior edge of dorsal concave; the height of its anterior rays exceeds the length of the head by half the diameter of the eye. Length of pectoral equal to length of head. Insertion of ventrals below sixth or seventh dorsal ray; length of ventrals $1\frac{1}{4}$ in head. First anal ray from base of caudal a distance equal to that between base of pectoral and base of ventral. First ray of anal and dorsal unbranched, shorter than the second, to which it is rather closely attached; last ray branched to base. Caudal broken, but apparently it was slightly forked.

Color silvery, brownish on back. The type is a badly faded specimen and no markings are evident.

The type and sole specimen is from Chemulpo, Korea; it measures 25cm. in entire length, and is numbered 51495, U. S. National Museum.

2. COREIUS Jordan and Starks, new genus.

This genus is related to *Zezera* and *Rohita*. It differs from the former in having the dorsal anteriorly placed, the snout blunt and projecting beyond the mouth, and the eye with a broad, thin, annular eyelid; from the latter, in having large barbels, teeth in one row, lips without a horny cutting edge, and dorsal short.

11. COREIUS CETOPSIS (Kner).

Two specimens collected at Chemulpo, Korea, by Jouy. The following description is of the larger one, 10 cm. in length.

Dorsal 9; anal 8; scales 52; transverse series 6 from first anal ray, 7 from first dorsal ray in oblique series to lateral line. Head 5 in

length: depth $4\frac{3}{5}$. Eye inside of adipose eyelid 8 in head; orbit $6\frac{1}{4}$; snout $2\frac{1}{5}$; maxillary $3\frac{1}{2}$; interorbital width $3\frac{1}{3}$; height of caudal peduncle $1\frac{2}{3}$.

Body moderately elongate, compressed, tapering slightly in nearly straight lines from behind dorsal to a very broad thin caudal peduncle. Anterior dorsal profile rather steep from dorsal to end of snout; slightly depressed above eyes. Snout blunt, overhanging the small mouth by a distance equal to the distance between edges of adipose eyelid. Mouth wholly inferior and with very thick lips. Maxillary reaching to space between the large nostrils; a long barbel at its end equal to half the length of the head. Eye with a thin annular eyelid. Interorbital evenly convex. Gill-rakers very small, 3+10 on first arch. Pharyngeal teeth in a single row of 5 on a side; they are coarse, somewhat compressed, and have an elongate flap or slightly concave grinding surface.

Scales rather elongate posteriorly, many of them with an angle behind. Lateral line almost perfectly straight everywhere.

First dorsal ray placed midway between tip of snout and base of last anal ray. Length of dorsal base, $1\frac{3}{4}$ in head. First anal ray one diameter of eye nearer base of caudal than base of ventrals. Insertion of ventrals under fourth or fifth dorsal ray. Pectoral barely reaching base of ventral. Caudal badly broken, apparently forked.

Color so faded little of it can be made out. Back dark brown or slate brown, lighter below; dorsal dusky, pectoral growing dark toward tip; ventral slightly dusky; anal colorless.

12. ZACCO TEMMINCKII (Schlegel).

Several specimens from Fusan. They seem to differ from specimens from Kawatana, Japan, only in being a little darker in color, and in having the lateral band more diffused.

3. FUSANIA Jordan and Starks, new genus.

Form slightly compressed; moderately deep. Mouth terminal. No barbels present. Gill-rakers short and few in number. Pharyngeal teeth in two rows. Scales large; lateral line wholly absent. Dorsal without an osseous ray; placed behind the ventrals. Caudal slightly forked. Dorsal and anal with short bases. Abdomen not compressed to a sharp edge.

13. FUSANIA ENSARCA Jordan and Starks, new species.

Dorsal, 9; anal, 9; scales, 32; transverse series, 9. Head, $3\frac{3}{4}$ in length; depth, $3\frac{3}{8}$. Eye, $3\frac{1}{3}$ in head; snout, $4\frac{1}{5}$; maxillary $2\frac{3}{4}$; interorbital space, $2\frac{1}{4}$; height of caudal peduncle, 2.

Snout blunt, shorter than eye. Mouth terminal; the lower jaw slightly projecting; maxillary reaching to below front of pupil. Inter-

orbital space broad, and evenly convex. Gill-rakers very small, 8 on lower limb of arch. Pharyngeal teeth slender and pointed; in two rows; 5, 3-3, 4 or 5, in number.

Scales large, thin, and firmly attached. Lateral line wholly absent.

Dorsal with a short base, its first ray midway between tip of snout and tips of middle caudal rays; when fin is depressed its tip reaches to opposite last anal ray. First anal ray distant from the caudal base once the length of the head.

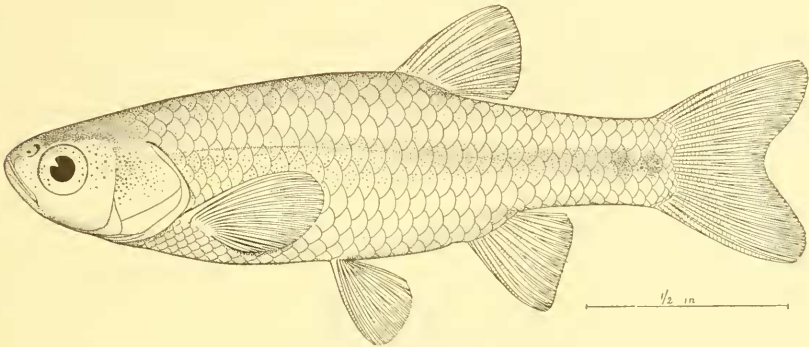


FIG. 4.—*FUSANIA ENSARCA*.

Insertion of ventrals in front of the dorsal a distance slightly exceeding the length of the eye. Pectoral reaching to within half the diameter of the eye of the ventral. Caudal moderately forked; the outer rays exceed the length of the middle rays by one diameter of the eye. Color: under parts silvery, back brown blending gradually downward. A much-diffused lateral band is present, growing darker posteriorly. Dorsal and caudal slightly dusky, other fins colorless.

The type and several cotypes were taken by Jouy at Fusan, Korea. They are from 40 to 58 mm. in length. The type is numbered 45265, U. S. National Museum.

14. *LEUCISCUS HAKUENSIS* Günther.

Gensan.

15. *LEUCISCUS SEMOTILUS* Jordan and Starks, new species.

Dorsal 9; anal 9; scales 66; 9 scales from anal and 12 from dorsal to lateral line. Head $3\frac{1}{2}$ in length; depth $4\frac{1}{2}$. Eye $4\frac{1}{2}$ in head; snout $3\frac{1}{4}$; maxillary $2\frac{3}{4}$; interorbital space 3; height of caudal peduncle $2\frac{1}{2}$.

Body moderately elongate, the head wide and very blunt. Snout blunt; as viewed from the side the outline is continuous with the nearly straight profile of head to above the nostrils where it curves rather steeply downward. Mouth broad and terminal, the lower jaw included. Maxillary reaching to below anterior margin of pupil. Interorbital space wide and evenly curved. Gill-rakers scarcely developed.

Pharyngeal teeth long, but not very sharp; the longer row of four or five teeth, the shorter usually with only one tooth, though sometimes with two.

First dorsal ray midway between base of caudal and front of eye; posterior margin of dorsal not concave, the long anterior rays do not reach past the posterior ones when fin is depressed. First anal ray distant from caudal base a third the length of body without caudal. Insertion of ventrals a little in front of the dorsal. Caudal forked or lunate when fin is extended.

Color brown mottled with darker scales. Belly dusky brown. A black streak along median line of back, and a diffused lateral streak, more conspicuous posteriorly. A large dark brown very conspicuous spot on base of dorsal rays; a lighter more diffused spot at base of caudal rays. Other fins slightly dusky.

This species somewhat resembles *L. jouyi* but is without the deep caudal peduncle.

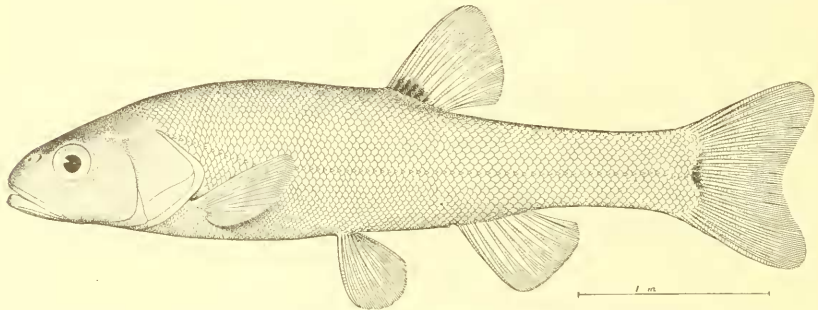


FIG. 5.—*LEUCISCUS SEMOTILUS*.

Several specimens taken in a fresh-water stream near Fusan, Korea, by Jouy.

The largest specimen is 125 mm. in length. The type is numbered 51500, U. S. National Museum.

Cotypes are numbered 8562, Ichthyological collections, Stanford University.

16. *LEUCISCUS TACZANOWSKII* Steindachner.

Gensan.

17. *PARAPELECUS JOUYI* Jordan and Starks, new species.

Dorsal 9, the first ray short unbranched; anal, 24, counting two short anterior rays; scales 40, $3\frac{1}{2}$ from first anal ray, $7\frac{1}{2}$ from first dorsal ray to lateral line. Head, $4\frac{1}{2}$ in length without caudal; depth, $4\frac{2}{5}$. Eye, $4\frac{1}{2}$ in head; snout, $3\frac{1}{2}$; interorbital space, $3\frac{3}{4}$; maxillary, 3.

Body moderately compressed and deep; the ventral outline more strongly convex than the dorsal; the entire ventral outline from isthmus to anal trenchant. Snout pointed, a little longer than eye. Posterior nostril long and narrow, its length contained $2\frac{1}{2}$ times in the

eye. Maxillaries strongly curved, reaching to below anterior margin of eye; a slight notch between them anteriorly to receive a sharp symphyseal knob. Jaws even in front when closed. Interorbital space rising obliquely from eye to the flattish median area. Gill-rakers small and sharp 2+10 in number. Pharyngeal teeth long, sharp, and slightly hooked; 5, 4, 2-2, 3, 4, in number.

Scales large and thin. Lateral line apparently as in *P. macherius*. Its course anteriorly can not be traced as the scales are absent in that region.

First ray of dorsal nearer base of caudal than tip of snout by a distance equal in length of second dorsal ray, which slightly exceeds combined length of snout and eye. Posterior edge of dorsal is straight: when fin is depressed all rays except the first are coterminous. First anal ray under tip of depressed dorsal. Anal base is contained $1\frac{1}{2}$ in head. Ventrals inserted entirely in front of dorsal, their tips are under the fourth dorsal ray.

Color of an old faded alcoholic specimen, bright silvery, dark brown on back; fins all light.

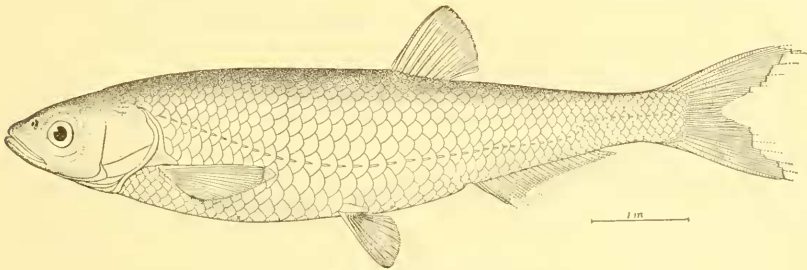


FIG. 6.—PARAPELECUS JOUYI.

This species differs from both *P. argenteus* and *P. macherius* in having much larger scales and a larger head.

The type and sole specimen is 20 cm. in length. It was taken at Chemulpo, Korea, by Jouy, for whom it is named. It bears the number 51497, U. S. National Museum.

18. *CULTER RECURVICEPS* (Richardson).

Chemulpo.

Family COBITIDÆ.

19. *MISGURNUS ANGUILLICAUDATUS* (Cantor)

Fusan.

20. *COBITIS TÆNIA* Linnæus.

Fusan and Gensan.

21. *ELXIS COREANUS* Jordan and Starks, new species.

Head $4\frac{1}{3}$ in length; depth, $5\frac{1}{2}$. Dorsal, 8; anal, 7; scales, 84. Eye, $5\frac{1}{3}$ in head; snout, 3; interorbital width, $3\frac{2}{3}$.

Head narrower than in *Elxis nikkonis*, the snout slightly more pointed. Barbels 8, about equal in length; a pair at nasals, 4 above

snout and one at end of each maxillary; no mandibular barbels present. Gill openings wholly lateral; joined to isthmus just below lower pectoral ray.

Scales small and cycloid, running in more or less definite oblique series, but the series are irregular and crowded, many of them extending only a short distance. Head entirely naked.

Front of dorsal midway between tip of snout and tip of caudal. Ventrals a very slight distance anterior to dorsal. Front of anal midway between insertion of ventrals and base of middle caudal rays. Caudal with many small axillary rays, which form a long keel on caudal peduncle above and below.

Color brown speckled, and spotted with darker brown. A dark blended lateral band extending at base of caudal in a conspicuous black spot, which runs out on caudal rays. A narrow dark streak through eye to tip of snout. Dorsal slightly spotted with brown. Wavy dark streaks across caudal rays; other fins light. Belly and under parts of head white. Other specimens are scarcely mottled, and have a dark,

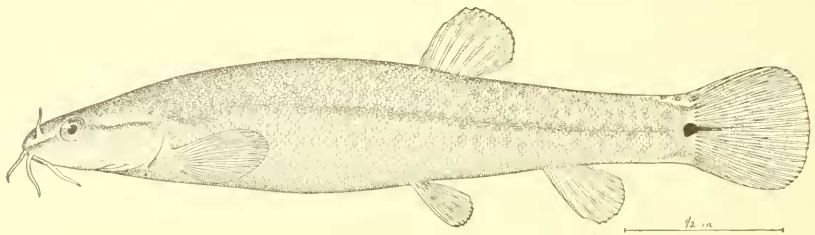


FIG. 7.—*ELIXIX COREANUS*.

clear-cut, broad, brown, lateral band in sharp contrast with the other body color.

This species may be known at once from *E. nikkonis* by the much smaller, more crowded scales. It is the best represented species in this collection, there being a couple of hundred specimens from Gensan and a few from Fusan.

The type is from Gensan, Korea, and is 63 mm. in length. It is numbered 45243, U. S. National Museum. Cotypes are numbered 8061 Ichthyological Collections, Stanford University.

Family POECILIIDÆ.

22. *APLOCHEILICHTHYS LATIPES* (Schlegel).

Many specimens were collected at Fusan. They have been compared with specimens from Wakanoura, Japan, and are apparently identical. The ventrals are not nearer to the operculum than to the vent, as described by Günther, nor midway between those points, as described by Schlegel, but nearer to the vent than to the operculum, as shown in Schlegel's figure.

Family SYNGNATHIDÆ.

23. SYNGNATHUS SCHLEGELI Kaup.

The dorsal covers 10 or 11 rings. Gensan.

Family AULORHYNCHIDÆ.

24. AULICHTHYS JAPONICUS Brevoort.

Fusan.

Family GASTEROSTEIDÆ.

25. PYGOSTEUS SINENSIS (Guichenot).

Pygosteus steindachneri JORDAN and STARKS, Proc. U. S. Nat. Mus., XXVI, 1903, p. 61.

Gensan.

A single specimen, having but 7 spines. As *Gasterosteus sinensis* is described from "China" as having 7 dorsal spines, it is, without much doubt, identical with *Pygosteus steindachneri*.

Family EXOCOETIDÆ.

26. HYPORHAMPHUS SAJORI (Schlegel).

Gensan and Fusan.

Family MUGILIDÆ.

27. MUGIL CEPHALUS Linnæus.

Gensan.

Family SCOMBRIDÆ.

28. SCOMDEROMORUS SINENSIS (Lacépède).

Chemulpo.

Family CARANGIDÆ.

29. TRACHURUS TRACHURUS (Linnæus).

Gensan.

Family STROMATEIDÆ.

30. STROMATEOIDES ARGENTEUS (Euphrasen).

Chemulpo.

Family APOGONIDÆ.

31. APOGON LINEATUS Schlegel.

Fusan.

Family SPARIDÆ.

32. PAGRUS CARDINALIS (Lacépède).

Fusan.

33. SPARUS SCHLEGELI (Bleeker).

Gensan.

Family HLEMULIDÆ.

34. POMADASIS HASTA (Bloch).

A specimen 12 cm. in length.

Family SCLENIDÆ.

35. COLLICHTHYS LUCIDUS (Richardson).

A small specimen from Korea, Bernadon coll. D. IX-27. A. II. 12. Scales 60.

4. LARIMICHTHYS Jordan and Starks, new genus.

This genus is close to *Larimus*, differing in having cycloid scales, unequal teeth, weak anal spines, and more cavernous head.

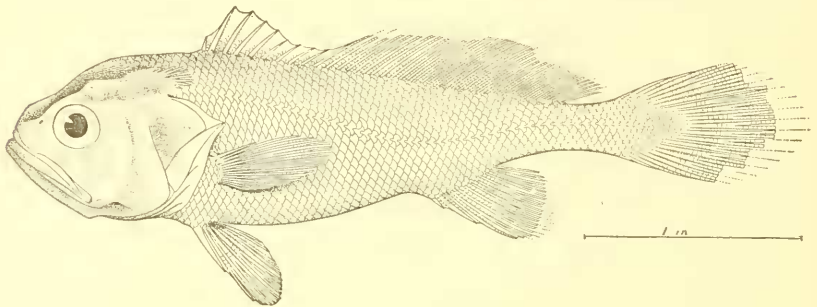


FIG. 8.—LARIMICHTHYS RATHBUNÆ.

36. LARIMICHTHYS RATHBUNÆ Jordan and Starks, new species.

Dorsal IX, 37; anal II, 10; few scales remaining, about 47. Head $3\frac{1}{2}$ in length; depth $3\frac{3}{4}$. Eye $3\frac{1}{5}$ in head; snout 4; interorbital space $3\frac{1}{5}$; maxillary $1\frac{5}{8}$; height of caudal peduncle 4.

Body compressed, deepest at the nape, tapering quickly backward to a rather narrow caudal peduncle; the outline under the dorsal fins forming a straight line. Mouth oblique; lower jaw projecting and with a low broad knob which fits into a shallow notch between premaxillaries. Anterior end of premaxillary on a level with middle of eye. Maxillary broad posteriorly reaching to below posterior margin of orbit; its whole length slipping under the transparent sheath projecting downward from suborbitals. Teeth in narrow bands, small and rather uneven, at intervals a curved tooth extends beyond the others, but they are scarcely long enough to be called canines. No teeth on vomer or palatines. Top of head and preopercular region rather cavernous. Gill-rakers long and slender, the longest $\frac{1}{5}$ the diameter of the eye.

Scales cycloid. A few scales on base of anal; no scales remaining on other fins. Lateral line curved up anteriorly and following the curve of the back.

Origin of spinous dorsal a little in front of pectoral base. Spines rather weak and low; the first spine scarcely half the length of the second and third which are the highest spines. They are scarcely longer than the orbit and not so long as the soft rays. The last spines are but little decreased in length making but a shallow notch between the spines and rays. The soft dorsal is long; the base of the last ray is one diameter of the orbit from the base of the caudal. Anal spines rather weak; the second $2\frac{1}{2}$ times the length of the first; the second about half the length of the soft rays and contained $3\frac{1}{4}$ times in the head. Length of anal base 3 times in head. Ventrals inserted a little in front of pectorals and reach half way from their insertion to the front of anal. Tip of pectoral opposite that of ventral. Caudal badly broken, apparently the middle rays were the longest as in *Larimus*; they were at least as long as the head posterior to the middle of the eye.

Color plain silvery, dark on back. Fins without markings or color.

The type and sole specimen was collected somewhere on the coast of Korea, by Jouy. It is 90 mm. in length and is numbered 45299, U. S. National Museum.

Named for Miss Mary J. Rathbun.

Family SILLAGINIDÆ.

37. *SILLAGO SIHAMA* (Förskål).

Family EMBIOTOCIDÆ.

38. *DITREMA TEMMINCKI* Bleeker.

Fusan.

Family LABRIDÆ.

39. *HALICHÆRES PÆCILOPTERUS* (Schlegel.)

Fusan.

Family TETRAODONTIDÆ.

40. *SPHEROIDES ALBOPLUMBEUS* (Richardson).

Chemulpo.

Family MONACANTHIDÆ.

41. *STEPHANOLEPIS JAPONICUS* (Tilesius).

Fusan.

Family OPHICEPHALIDÆ

42. OPHICEPHALUS ARGUS Günther

Chemulpo.

Family ANABANTIDÆ

43. ANABAS OLIGOLEPIS Bleeker.

Fusan.

Family SCORPENIDÆ

44. SEBASTISCUS MARMORATUS (Cuvier and Valenciennes).

Fusan.

45. SEBASTODES FUSCESCENS (Houttuyn).

Gensan.

Family COTTIDÆ.

46. TRACHIDERMUS ANSATUS (Richardson).

Chemulpo.

47. PSEUDOBLENNIUS PERCOIDES Günther.

Fusan.

48. FURCINA ISHIKAWÆ Jordan and Starks.

Fusan.

49. PARACENTROPOGON RUBRIPINNIS (Schlegel).

Fusan.

Family TRIGLIDÆ.

50. LEPIDOTRIGLA GÜNTHERI Hilgendorf.

Fusan.

Family GOBIIDÆ.

51. BOLEOPHTHALMUS CHINENSIS (Osbeck).

52. PERIOPHTHALMUS CANTONENSIS (Osbeck).

"Korea."

53. CORYPHOPTERUS VIRGATULUS (Jordan and Snyder).

Fusan and Gensan.

As the type of *Ctenogobius* (*fusciatus*) is said to have the tongue emarginate, the species with the tongue rounded, called *Ctenogobius* by Jordan and Snyder, and lately *Mugilogobius* by Professor Smitt, of Stockholm, may retain the name *Coryphopterus*, given to one of them by Doctor Gill. No type is assigned to *Mugilogobius* by Smitt, but the author of the genus informs me that the species on which it was based is *Ctenogobius abei* of Jordan and Snyder.

54. *CORYPHOPTERUS BERNADOUI* Jordan and Starks, new species.

Head $3\frac{1}{2}$ in length; depth 5; eye $3\frac{4}{5}$ in head; snout $3\frac{1}{2}$; maxillary $2\frac{3}{4}$. Dorsal VI-II; anal 11; scales 25.

Body robust; the head rather large and scarcely compressed; caudal peduncle deep, $2\frac{1}{5}$ in head. Snout rather short and blunt. Eyes large, separated by a narrow concave interspace; preorbital margin produced. Mouth oblique; lower jaw projecting; maxillary extending a little past the anterior margin of orbit, tongue rounded. Simple teeth in bands on jaws, the outer ones enlarged, a strong canine at each side of lower jaw. Gill openings not extending very far anteriorly; the isthmus broad, 3 in length of head. Gillrakers short and blunt, 2+10 on first arch.

Nape top of head behind the posterior margin of the eyes closely covered with small cycloid scales in about 24 series; similar scales on upper part of opercles. Scales on body finely ctenoid; the free edge

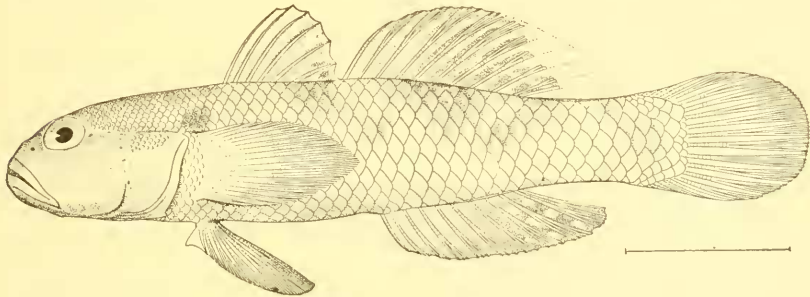


FIG. 9.—*CORYPHOPTERUS BERNADOUI*.

of most of them forming a right angle with the point directed backward; rather large cycloid scales on breast.

Dorsals well separated; when depressed the tips of the longest spines reach the base of the first soft ray; none of the spines produced; the soft dorsal slightly higher than the spinous. Origin of anal under third soft dorsal ray; anal rays a little shorter than those of dorsal. Pectoral scarcely reaching to vertical from vent, its tip slightly pointed. Caudal rounded.

Color of a rather faded alcoholic specimen, light, with 5 brown blotches on back and 5 similar ones on side below the interspaces of the former ones; the last spot at base of caudal; faint traces of longitudinal streaks on side. Spinous dorsal with a faint blotch posteriorly; soft dorsal with a brown streak down the membrane in front of each ray; the posterior ones narrowly divided into 2 or 3 spots. Anal light at base, growing dark toward tips of rays; 3 rows of conspicuous white spots across the posterior rays. Pectoral with a slight dusky tinge below; ventral rays dusky toward tips; caudal without color.

This is the only other *Coryphopterus* in the vicinity of Japan besides *C. abei* having scales on the upper part of the opercles. It does not otherwise resemble that species, being closer to *C. virgatulus* and *C. pflaumi*, from which it differs, in addition to the scales on the opercle, in color, and in having the scales on nape and top of head smaller and much more numerous.

The type and only specimen 13 cm. in length collected by Jouy and labeled "probably Korea." It is numbered 51499, U. S. National Museum.

55. CHÆNOGOBIUS MACROGNATHOS (Bleeker).

Gensan and Fusan.

56. CHLOEA SARCHYNNIS Jordan and Snyder.

Gensan.

We may here call attention to a mistake in the description and key of *Chloea castanea* in Jordan and Snyder paper on the Goboid fishes of Japan.^a

Head $2\frac{2}{3}$ in length should be $3\frac{2}{3}$, or, as given in their tabulated measurements, 25 to 28 hundredths of length.

57. CHASMICHTHYS GULOSUS (Sauvage).

Chasmias misakius JORDAN and SNYDER, Proc. U. S. Nat. Mus., XXIII, 1901, p. 761.

Fusan and Gensan.

The larger specimens do not have the white spots on sides arranged so conspicuously in cross series as in specimens from Japan, and the dark spot at base of caudal is absent.

Two others are a uniform brown without markings. The fins dusky.

58. CHASMICHTHYS DOLICHOGNATHUS (Hilgendorf).

"Korea."

59. PTEROGOBIUS ELAPOIDES (Günther).

"Korea."

60. ACANTHOGOBIUS FLAVIMANUS (Schlegel).

Fusan.

The maxillary in the species reaches variably from below the anterior edge of orbit to below the posterior edge of pupil.

61. ACANTHOGOBIUS HASTA (Schlegel).

Dorsal IX-20; anal 16; scales 60. Head $4\frac{1}{3}$ in length without caudal; depth 8. Eye 9 in head; snout 3; maxillary $2\frac{1}{2}$; interorbital space 7; height of caudal peduncle $4\frac{1}{4}$.

Snout rather blunt, its upper outline turning at an angle at about its middle and steeply descending. Mouth large, lower jaw slightly

^a Proc. U. S. Nat. Mus., XXIV, 1902, p. 79.

included; maxillary reaching slightly past front of eye. Interorbital slightly concave, a ridge on each side of it which converges with its fellow posteriorly, turns at a sharp angle and is continued downward a short distance behind eye. Teeth irregularly placed in one or two series on the side, in three or four on front of jaws; the outer series enlarged. Tongue truncate at tip. Gillrakers short, 4+9 on first arch.

No scales remain on body of our specimen. Nape and occipital region closely covered with small cycloid scales. Pectoral base and region in front of ventrals with similar, but thinner and less conspicuous scales. A small region near middle of cheek, another at upper part just behind eye and the upper half of opercle with circular scattered scales,^a nowhere in contact with each other; the naked areas on cheek are of much greater extent than the scaled areas.

First dorsal spine placed $1\frac{1}{2}$ times the length of the eye behind tip of opercular flap; the last spine connected by membrane to back, its base above tip of pectoral; base of spinous dorsal half length of head. Distance from base of last spine to first dorsal ray is slightly less than length of snout. Front of second dorsal nearer the snout than base of caudal by the length of snout; length of dorsal rays near middle of fin, $2\frac{1}{3}$ in head and only a little longer than the posterior rays. Origin of anal under fourth or fifth dorsal ray, under next to last dorsal ray. Length of ventral equals combined length of snout and eye. Caudal somewhat broken, but at least as long as head.

Color uniform brown on back, white below, spinous dorsal, ventral pectoral, and anal colorless; caudal dusky; each ray of soft dorsal is crossed by 5 or 6 spots, as shown in Schlegel's plate.

Length of specimen, 25 cm. It was collected at Chemulpo, Korea, by Jouy.

62. ACANTHOGOBIUS STIGMOTHINUS (Richardson).

Form and general appearance of *A. hasta*, but resembling *A. flavimanus* in number of fin rays and the markings on dorsals and caudal. The anal is edged with black and the ventrals are black edged with white. It may be at once known from *A. flavimanus* by the smaller mouth and more slender head and body; the spinules and the scales are finer and more regular, the scales much smaller.

A single specimen from Fusan.

^aJordan and Snyder in Gobioid Fishes of Japan (Proc. U. S. Nat. Mus., XXIV, p. 102), suppose that this species has a naked head from Schlegel's picture. Schlegel says nothing on this point in his description, and they had no specimens. Gill's genus *Synechogobius* can not be retained, as *hasta* (the type) does not differ materially from *Acanthogobius* except in having 5 or 6 more dorsal rays. *A. stigmothinus*, though having the number of dorsal and anal rays of *A. flavimanus*, is similar to *A. hasta* in form and general appearance.

63. TRIDENTIGER OBSCURUS (Schlegel).

Gensan.

64. TRIDENTIGER BIFASCIATUS (Steindachner).

Fusan and Chemulpo.

The longitudinal stripes are not conspicuous.

Family PLEURONECTIDÆ.

65. PLEURONICHTHYS CORNUTUS (Schlegel).

Korea.

66. PLATICHTHYS STELLATUS (Pallas).

Gensan.

67. KAREIUS BICOLORATUS (Basilewsky).

Pleuronectes scutifer STEINDACHNER.

Gensan.

Family PTEROPSARIDÆ.

68. PARAPERCIS SNYDERI Jordan and Starks, new species.

Dorsal v-21; anal 17; scales 40; transverse oblique rows 3+10. Head $3\frac{2}{3}$ in length; depth $4\frac{1}{2}$. Eye $3\frac{1}{2}$ in head; snout $3\frac{2}{3}$; interorbital space $9\frac{1}{4}$; maxillary $2\frac{2}{3}$; height of caudal peduncle $2\frac{1}{4}$.

Body moderately elongate, a little compressed, head pointed as deep as wide; the anterior profile descends in a regular curve from dorsal to tip of snout. Jaws even, or the lower very slightly projecting. Teeth fine, set in a rather broad band on each jaw, the outer series enlarged. Small sharp teeth in narrow bands on vomer and palatines. Maxillary reaching to below front of pupil. Interorbital space narrow and flat, its width two-fifths of eye. Opercle with two spines on its posterior edge, the upper one larger than the lower, these on one or both sides may be divided at the tips irregularly into 2 or 3 points. Gill-rakers short 3+9 on first arch. Pseudobranchia large.

Scales everywhere roughly ctenoid; the spinules very numerous on each scale and close set. Cheek closely covered with 4 longitudinal rows of large scales; about three-fourths as large as those on the body. Lateral line arched for the greater part of its length; the arch slightly greater than the curve of the back.

Distance from tip of snout to first dorsal spine equal to distance from tip of snout to pectoral base; distance from first dorsal spine to first dorsal ray equal to distance from tip of snout to middle of eye. Third dorsal spine the longest, contained three times in head. The membrane of the last dorsal spine is slightly connected to base of first ray. The last dorsal rays when depressed reach to base of caudal rays.

First anal ray half the diameter of the eye nearer tip of snout than base of caudal. Anal coterminous with soft dorsal. Tip of inner ventral ray reaches to base of second anal ray; its length $1\frac{1}{10}$ in head. Length of pectoral equals length of caudal, which is $1\frac{1}{4}$ in head. Caudal truncate, its upper angle sharper than its lower.

Color light brown with 5 V-shaped dark blotches on back. A colorless lateral band, below which are 8 or 9 blended elongate cross spots. Head with several dark spots; a series of 3 or 4 white spots following lower edge of subopercle. Lips dark brown, and a dark spot at tip of mandible. Spinous dorsal dusky, soft dorsal opaque white with 3 or 4 small round transparent spots between each ray appearing like holes in the membrane. Caudal similarly marked, but the colorless spots are not confined to the membrane. A dark brown spot on base of lower pectoral rays. Other fins colorless.

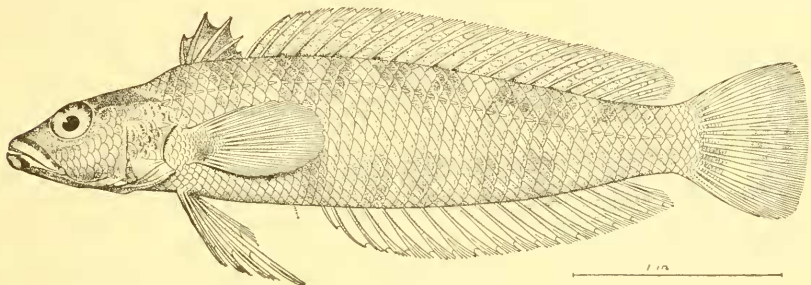


FIG. 10.—*PARAPERCSIS SNYDERI*,

A specimen from Nagasaki, Japan, differs in having dark spots on dorsal and caudal, and the anal dusky. A light band extends downward from each eye.

This species differs from *Parapercis cylindrica* in having 40 instead of 50 scales in lateral line, the ventrals and spinous dorsal shorter, and the color markings different.

The type is labeled Korea without more definite locality. It is 97 mm. in entire length, and is numbered 51498, U. S. National Museum. A cotype is in the collections of the Stanford University Museum. It was collected at Nagasaki, by Jordan and Snyder.

Family CALLIONYMIDÆ.

69. *CALLIONYMUS VALENCIENNESI* (Schlegel)

Fusan.

Family BLENNIIDÆ.

70. *PHOLIS TACZANOWSKI* (Steindachner).

Gensan and Fusan.

Family ZOARCIDÆ.

71. ZOARCES GILLII Jordan and Starks, new species.

Dorsal 84, XIX, 14; anal 80+. Head $5\frac{3}{8}$ in length; depth 10. Eye 5 in head; maxillary $2\frac{1}{8}$; snout $3\frac{1}{8}$.

Head not at all compressed, as wide as deep. Snout very blunt, its upper surface on same curve with top of head, but toward its tip bluntly angulated and turning steeply downward. Eye at extreme upper profile of head. The interorbital space flat and wide; the extreme width is contained $3\frac{3}{4}$ times in head; the bone, only $6\frac{1}{2}$ times; the interorbital bone, is rather deeply concave for its full width, not channeled along its middle.

Maxillary reaching to below posterior margin of pupil. Lower jaw included. Teeth sharp and more irregular than in *Z. longatus*; in a single row except in front where 3 or 4 teeth on each side form a double row. Gillrakers short and sharp; 3+14 on first arch.

Scales small, circular, and partially embedded; front of anal and dorsal naked; breast behind base of ventrals with scales.

Second ray of dorsal is directly above gill opening.

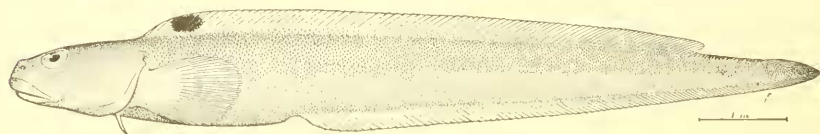


FIG. 11.—ZOARCES GILLI.

Front of anal twice the length of the head from tip of snout. Pectoral broad and rounded; its length $1\frac{1}{2}$ in head. Length of ventrals $\frac{3}{8}$ diameter of eye; tips of ventrals just reach to base of pectoral rays.

Color: Back light brown, abruptly changing to white at middle of sides; a narrow, light band along back a little distance below base of dorsal posteriorly separates the greater portion of the black color in this region into a lateral band. Twelve large inconspicuous blotches, larger than the spaces between them, along sides. Top of head dark brown, the sides light brown with white spots marking the position of small pores, lower part of head white. Dorsal, light dusky brown; a very conspicuous large, dark-brown spot on front of dorsal, the dorsal margined above it with white. Anal dusky, bordered with lighter posteriorly; its greater part white. Other fins white.

This species differs from *Z. longatus* in having a wide, flat interorbital space; the eyes placed at the upper profile of head; in having a longer spinous dorsal and particularly in color. A specimen of *Z. longatus* from Iwani in Shiribeshi, Japan, in the ichthyological collection of Stanford University has the head compressed, the interorbital strongly convex, the bone narrow, and high above the eyes.

The type and sole specimen is 24 cm. in length. It was taken at Fusan, Korea, by Jouy, and is numbered 45355, U. S. National Museum.

Named for Dr. Theodore Gill.